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Madame Chairman and distinguished Members.

My name is Alan Waltar. I am Director of Nuclear Energy at the Pacific Northwest National Laboratory and an employee of Battelle, which operates PNNL for the Department of Energy. I mention this up front, since Battelle is leading a team to bid on the new INL contract. However my testimony is based almost exclusively on my nearly four decades of activity in the nuclear profession, largely uncoupled with Battelle. Further, I am not a member of the Battelle team working on the INL bid proposal.

I come to you having formerly served as Professor and Head, Department of Nuclear Engineering, Texas A&M University, and prior to that some 25 years with Westinghouse Hanford Company in a variety of scientific and management roles associated with advanced nuclear reactor design and operation. I also had the privilege of serving as President of the American Nuclear Society, an experience that has allowed me to become aware of the vital global contributions that nuclear energy, properly developed and managed, can make to the advancement of civilization.

Because of time constraints, I plan to stress in my oral presentation the major driving forces that justify the creation of the new Idaho National Laboratory. I have included responses to specific questions in the attached written testimony.

Access to abundant and affordable supplies of energy is crucial to development and it is the driving force behind our economy and our national security system. Given this reality, when a large and growing portion of our energy supply is embedded in unstable regions of the world, a monumental price must be paid--monetarily, politically, and even militarily. Even more sobering, nations without access to adequate energy supplies remain chronically underdeveloped—thereby providing the breeding grounds for terrorism to fester and grow in retaliation to the wealthy of the world. Finally, there is mounting evidence that in our quest for additional energy supplies we need to significantly reduce the emission of greenhouse gases that contribute to global warming.

In response to this situation, I believe the United State must

1. Drastically reduce its dependence on foreign oil (particularly from the Middle East);
2. Develop domestic energy supplies capable of sustainable development that are consistent with environmental stewardship; and

3. Work to substantially reduce the stark differences in quality of life among the peoples of the world.

In my judgment, the only source of energy capable of credibly responding to this situation in the timeframe we have available is nuclear energy. True, essentially ALL sources of energy will be needed. But it is only wishful thinking to assume that the growth in our longer-term, world-wide energy requirements can be provided by a combination of conservation, fossil fuels, and renewables. It simply cannot be done.

If we as a nation do nothing to advance the safety, economy, and proliferation protection for the next generation of nuclear reactors, we will miss a great opportunity to ensure a viable future of global nuclear energy deployment. As a consequence, we will leave our economy and environment hostage to increasing fluctuations and the unavoidable degradation that comes with relying so heavily on a fossil fuel future.

It is within this context that I welcome the potential for adopting a national energy policy that embraces a major new commitment to the development of nuclear energy. I am likewise pleased that the Department of Energy has designated the new Idaho National Laboratory to be the focal point for advanced reactor and fuel cycle development—the site where over 50 new reactor concepts were built and tested. These developments provide a signal that our nation recognizes the steps necessary to provide the global leadership needed to enable nuclear technology to play the role that only it can play.

However, it is also my judgment that this new commitment can succeed only if the following support is provided:

1. A substantial increase in sustained funding. The benefits to be derived from a robust commitment to advanced nuclear science and engineering, including the Next Generation Nuclear Plant (NGNP) as a central focus, are enormous. The higher efficiencies projected from this reactor for the production of both electricity and hydrogen (a key new energy carrier to replace petroleum for transportation), are essential components of a successful energy policy. Attaining a capability where advanced nuclear science is balanced with other energy sources justifies an annual commitment in the range of $300M to $500M over the next few years, as noted by the April 2003 Six Laboratory Group plan "Nuclear Energy: Power for the 21st Century" (attached).

2. Whereas the focus of the project should be at INL, I would recommend that full advantage be taken of the "Six Laboratory Directors' Report," which represents a solid commitment from the directors of key national laboratories to fully integrate the technical resources (staff and facilities) required to assure success in restoring U.S. leadership in nuclear technology. These six labs, now expanded to seven, (including Argonne National Laboratory, Los Alamos National Laboratory, Lawrence Livermore National Laboratory, Sandia National Laboratory, Oak Ridge National Laboratory, Pacific Northwest National Laboratory, and the current Idaho Nuclear Engineering and Environmental Laboratory) represent the

core of government-owned nuclear capabilities currently existing in our nation. These laboratories, partnered with private industry and the U.S. academic community, provide enormous potential for success.

3. By combining the two complementary capabilities of INEEL and ANL-W into one integrated laboratory, with a clear charter and sustained support, a truly "World Class" national laboratory can be created—capable of attracting both on-site talent and engaging the talent remaining at other national laboratories, academic institutions, and private industry to fully integrate the program needed to assure the U.S. with the energy source so vital to our future. By integrating the current Generation IV, Advanced Fuel Cycle Initiative, and Nuclear Hydrogen Initiative programs into a coherent effort, focused at INL but utilizing the best talent the nation has to offer, the U.S. can, indeed, lead the world in developing the next generation nuclear power plants, including the fuel cycles necessary to minimize reactor waste.

4. As a former educator, I wish to stress how important it is for our nation to build new nuclear facilities and support new nuclear research programs to attract and employ the best students that our universities can supply in the nuclear discipline. A combination of new, exciting projects, along with direct university support, is vital in ensuring an adequate supply of next generation, well educated professionals in this important field.

Now to the specific questions posed:

1. *What should the U.S. goals be in the field of nuclear power? How can the new Idaho National Laboratory best contribute to those goals?*

   Response: I believe the testimony written above provides the major part of my answer. As a target, I believe an aggressive goal would be for half of the electricity produced in the U.S. in the year 2050 to be supplied by nuclear energy and as much as 25% of the U.S. transportation fuels supplied by nuclear-generated hydrogen by 2050. These are extremely ambitious goals, but I believe we should strive hard to meet them. A strong Idaho National Laboratory, properly staffed and funded, is essential to providing the leadership necessary to allow these ambitious but important goals to be met.

2. *Are there gaps in the Department's present nuclear energy research and development (R&D) portfolio? Are there current research programs you would recommend discontinuing? If so, please explain your recommended changes.*

   Response: I believe the current framework is satisfactory. The problem is that the funding is so anemic that very little actual progress is possible. One of the great tragedies is the continuing erosion of the national nuclear infrastructure. Prime examples include the shutdown and decommissioning of the Experimental Breeder Reactor –II (EBR-II) and the Fast Flux Test Facility (FFTF), the newest

reactor in the DOE complex. With the combined demand for transmutation of objectionable isotopes (to extend the lifetime of Yucca Mountain), and the longer-term needs to extract considerably more energy from uranium, a new fast spectrum reactor will have to be built—at a cost of at least $2 billion. Losses of this nature cannot, in my judgment, continue if the U.S. is serious about its commitment to nuclear power. I also believe that such losses provide an unacceptable trend in reducing the capacity of our nation to produce isotopes for medical, agricultural, and industrial purposes. Over 90% of the life-saving medical isotopes currently used in the United States come from abroad.

3. *The Department is working in partnership with the nuclear power industry to enable a new nuclear plant to be ordered and licensed for deployment within the decade. Is the nuclear energy R&D portfolio adequate to meet this goal? If not, how could this be rectified?*

   Response: The current R&D program is probably adequate to support the 2010 new commercial nuclear initiative. What is needed are sufficient federal incentives to overcome the risks that any utility (or utility consortium) would have to bear in constructing a new plant—particularly if the plant were to be located in an unregulated market. The utilities MUST have federal incentives or some type of guaranteed return in order to reduce the financial risks to commercial acceptability for the first new plant order. Incentives could include a carbon tax credit, a guarantee for the price of electricity for a time long enough to amortize the cost of construction, or other ways to allow the private sector to step up to the plate.

4. *The Next Generation Nuclear Plant (NGNP) has been described both as a demonstration of commercial viability and as a research test bed. What is your view of the purpose of the NGNP? To what extent is the design of the NGNP being influenced by the requirements imposed by hydrogen production? To what extent will INL be capable of world leadership in nuclear energy R&D if the Next Generation Nuclear Plant (NGNP) does not go forward?*

   Response: I believe the principal purpose of the NGNP is to serve as an advanced test bed to demonstrate high temperature operation (both for higher efficiency electricity production and for the production of hydrogen). However, requesting private participation in designing and building the plant represents a first and important step to inject strong commercial potential for the plant. Certainly the projection of hydrogen is a strong driving force for the particular design underway—and this is important, since our nation MUST find a way to drastically reduce the need for oil, and hydrogen represents a very distinct alternative energy carrier. But if the NGNP is not funded and built, the INL will not be able to serve as a world class laboratory. It simply will not be able to draw the talent necessary to achieve such distinction.

Thank you very much.